

# PATENT ABSTRACTS OF JAPAN

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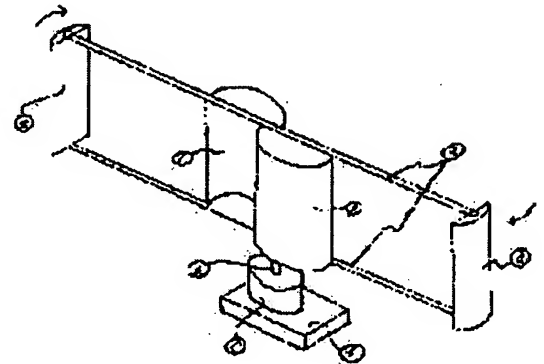
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## (54) HYBRID WINDMILL TYPE POWER GENERATION SYSTEM

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To enable an installation on a roof by providing support frames extending symmetrically right and left around a rotational axis along a wind receiving face, on upper and lower ends of a Savonius type windmill, and providing propeller type floating force utilizing vanes on both ends of the support frames vertically in parallel with the rotational axis.

**SOLUTION:** Support frames 2, 2 are provided on upper and lower end rotational faces of a Savonius type windmill vanes so as to extend symmetrically right and left around a rotational axis 4 along a wind receiving face. On both ends of the frames 2, 2, propeller type vanes 3, 3 are mounted vertically in parallel with the rotational axis 4. In this windmill, the vanes 1, 1 receive resistance at first and start at low rotational speed. Along with the start of rotation, a peripheral speed ratio increases on account of a difference between rotation radii of the vanes 3, 3 and it becomes suitable for the high efficiency conditions of Darius type vanes. Accordingly, this windmill implements both low peripheral speed operation of the Saponius type and high speed peripheral operation of the Darius type. Also with a relatively flat structure for horizontal rotation, it can be mounted on a roof easily.



## LEGAL STATUS

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## [Claim(s)]

the slowdown NIUSU mold wind mill of a vertical-axes rotation mold -- setting -- the surface of revolution of the upper limit and a lower limit -- a top -- and the wind mill which consists of a support room which passes along a revolving shaft along with \*\*\*\*\* of this wind mill, a slowdown NIUSU aerofoil, and an aerofoil of the lift use which had the upper and lower sides supported by the distant enough location by the support frame, and is characterized by carrying out generator installation at a revolving shaft

## [Detailed Description of the Invention]

[0001] "Technical field to which invention belongs" this invention relates to a wind power method.

[0002] Conventionally [ "Prior-art" ], as a high-speed rotation wind mill for a generation of electrical energy, there are a propeller mold, a Darius mold, etc. and there are a slowdown NIUSU mold, many profiles, etc. as an object for low-speed rotation (for un-generating electricity).

[0003] although the wind mill for a generation of electrical energy of hundreds of kW class is put in practical use with the propeller mold and the Darius mold conventionally [ "Object of the Invention" ] -- high-speed rotation -- aiming -- a strong, comparatively high stand and wind direction -- control etc. was needed, and when aiming at a small-scale generation of electrical energy of one to 3 kWh for home use, it was not necessarily able to be said to be the optimal method. Therefore, the method which was suitable for the installation on a roof etc. also structurally is needed comparatively at a low speed.

[0004] "the means for solving a technical problem" -- the hybrid mold which combined the lift property of the powerful slowdown NIUSU mold of turning effort and a propeller type aerofoil as follows comparatively at a low speed is adopted.

[0005] a core [ wind mill / of comparatively low height / slowdown NIUSU mold ] -- the surface of revolution of the upper limit and a lower limit -- a top -- a revolving shaft -- a passage -- \*\*\*\*\* -- meeting -- bilateral symmetry -- having been extended -- two -- a \*\* -- a support frame is

installed. The aerofoil of lift use of a propeller mold is installed in the both ends of two support frames at right angles to a revolving shaft in parallel, and an aerofoil is arranged so that a curved surface may be suitable of the outside of a turning circle and a flat surface may be suitable inside.

[0006] It is fixed to a slowdown NIUSU mold wind mill, and a support frame is rotated with a slowdown NIUSU mold wind mill.

[0007] The gestalt of operation of this invention is explained to a \*\*\*\*\* concrete target below "the gestalt of implementation of invention" at a drawing. Drawing 1 shows the whole this invention assembly Fig. In drawing, the wing by which, as for 1, the hemicycle of a slowdown NIUSU mold wind mill faces, and 2 are support frames, and the aerofoil 3 of a propeller mold is installed in both ends. The revolving shaft 4 of a wind mill is connected through the generator 5, direct, or accelerating gearing. These are all installed on the support stand 6.

[0008] When a wind blows, the above-mentioned wind mill receives reaction in the Savonius-windmill section first, and begins low-speed rotation (peripheral-speed ratio = about 1). With the propeller type aerofoils installed in the both ends of a frame with rotation initiation, a peripheral-speed ratio increases greatly by the difference in a radius of gyration (for example, a peripheral-speed ratio = 4-5), and it is suitable for the efficient employment conditions of the Darius type aerofoil. The centrifugal force by lift occurs on the outside of an aerofoil, and rotation of a wind mill is accelerated. the force according [ the turning effort of a wind mill ] to the reaction of a Savonius windmill at this time, and the lift in a propeller aerofoil -- a basis -- the angular moment occurs according to a \*\*\*\*\* centrifugal force, and it becomes both sum.

[0009] Like the "effect-of-the-invention" above, the wind mill by this invention realizes to coincidence low peripheral-speed employment asked for a slowdown NIUSU mold, and high peripheral-speed employment asked for the Darius mold, and gathers the energy conversion efficiency of a wind mill. moreover, the comparatively flat structure of performing level rotation -- it is -- a roof top -- installing -- easy -- and wind direction -- control is unnecessary. Moreover, starting is also allotted

centering on the slowdown NIUSU mold wind mill, and it is easy.

[0010]

[Brief Description of the Drawings]

[Drawing 1] Hybrid wind-mill structural drawing by this invention is shown.

[Description of Notations]

- 1 Slowdown NIUSU Mold Wind-Mill Wing
- 2 Support Frame
- 3 Propeller Type Aerofoil
- 4 Revolving Shaft
- 5 Generator and Bearing Equipment
- 6 Support Stand

Drawing 1

図1 ハイブリッド発電方式構造図

